PROCEDURE 11 - Hearing Conservation

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Synopsis

The purpose of this procedure is to provide guidelines to reduce potential overexposure to noise. This procedure applies to all NWS facilities and work locations where hearing protection is used, and to the employees using hearing protection.

Initial Implementation Requirements:

- **Analyze Site Operations versus Procedure Requirements**
  - Conduct Noise Survey at the Site. *(11.5.2b)*
  - Evaluate Feasible Engineering and Administrative Controls *(11.3.2a)*
- **Develop/Obtain Documentation/Information required for Site**
  - Establish a Hearing Conservation Program. *(11.3.2d)*
    - Develop a Noise Monitoring Program. *(11.3.2e.1)*
    - Develop an Audiometric Testing Program. *(11.3.2e.4)*
  - Prepare Employee Exposure Records. *(11.3.2f.1)*
  - Develop Audiometric Test Records. *(11.3.2f.2)*
- **Designate Person to Administer Hearing Conservation Procedure Requirements**

Provide Local Training of Site Personnel

  - Training for affected Personnel. *(11.3.1b, 11.3.2e.7)*
- **Inventory Material/Equipment (Procure as required)**
  - Postings, Signs. *(11.5.2, 11.3.2e.6)*
  - Hearing Personal Protective Equipment (PPE). *(11.5.2, 11.3.1a, 11.3.2e.5)*

Recurring and Annual Task Requirements:

- **Perform Assessment/Testing/Update Documentation**
  - Maintain a Hearing Conservation Program. *(11.3.2d)*
    - Develop a Noise Monitoring Program. *(11.3.2e.1)*
    - Develop an Audiometric Testing Program. *(11.3.2e.4)*
  - Maintain Employee Exposure Records. *(11.3.2f.1)*
  - Maintain Audiometric Test Records. *(11.3.2f.2)*
- **Provide Refresher Training for Site Personnel**
  - Annual Refresher Training for affected Personnel. *(11.3.1b, 11.3.2e.6)*
- **Inspect/Replace/Recalibrate Material/Equipment**
  - Hearing PPE.*(11.5.2, 11.3.1a, 11.3.2e.5)*
  - Postings, Signs. *(11.5.2, 11.3.2e.6)*

Hearing Conservation Checklist

Requirements	EHB 15 Reference	YES	NO	N/A	Comments
Is initial and annual review of this procedure conducted and documented?	11.4.2				
Is there an annual review of this procedure?	11.4.2				
Are there any areas in the workplace where continuous noise levels exceed 85dBA?	11.3.2.d				
Is there an annual training program to educate employees in safe levels of noise, exposures; effects of noise on their health; and the use of personal protective equipment?	11.3.2e.7 11.3.1b				
Does this facility have a Hearing Conservation Program for employees who are exposed to noise levels equal or exceed an 8-hour time-weighted average sound level of 85 decibels?	11.3.2d				
Does this facility have a noise monitoring program to identify employees for inclusion into the Hearing Conservation Program and to enable the proper selection of hearing protectors?	11.3.2e.1				
Are noise levels being measured using a sound level meter or an octave band analyzer and records being maintained?	11.3.2b				

Requirements	EHB 15 Reference	YES	NO	N/A	Comments
Have engineering controls been used to reduce excessive noise levels? Where engineering controls are determined to not be feasible, are administrative controls (i.e. worker rotation) being used to minimize individual employee exposure to noise?	11.3.2a				
Are signs "Hearing Protection Required" posted in high noise areas?	11.3.2e.6				
Is approved hearing protective equipment available to every employee working in noisy areas?	11.3.1a & 11.3.2e.5				
Are employees properly fitted and instructed on the use and limitations of ear protectors?	11.3.1b				
Has baseline audiometric testing been conducted for all affected personnel?	11.3.2e.4				
Is there an established and maintained an audiometric testing program for all affected employees?	11.3.2e.4				
Are all audiometric test records maintained for the duration of the employees employment?	11.3.2f.2				
Are employees noise exposure measurement records maintained for two years?	11.3.2f.1				

11 HEARING CONSERVATION

11.1 Purpose and Scope

As part of its goal to provide a safe and healthful workplace, the National Weather Service (NWS) is implementing this procedure to protect employees from the effects of overexposure to noise. This procedure applies to all NWS facilities, work locations, and employees where hearing protection is used.

11.2 Definitions

Action Level. An 8-hour, time-weighted average (TWA) of 85 decibels measured on the A-scale, slow response, or equivalently, a dose of 50 percent.

Audiometric Testing Program. A program in which audiometric testing is made available to all employees whose noise exposures equal or exceed an 8-hour time-weighted average of 85 decibels.

Baseline Audiogram. The audiogram against which future audiograms are compared.

Continuous Noise. Broadband noise of approximately constant level and spectrum to which an employee is exposed for a period of eight hours per day, 40 hours per week. (When the variations in noise level involve maxima at intervals of one second or less).

Criterion Sound Level. The decibel level that will yield a 100 percent dose in eight hours. For OSHA, 90 dBA is typically used.

Decibel (dB). A unit used to express sound-power level and sound-pressure level.

dBA. Sound level in decibels read on the A scale of a sound-level meter.

Field office. A Field Office may include the following: Weather Forecast Office (WFO), River Forecast Center (RFC), Weather Service Office (WSO), and a Data Collection Office (DCO).

Hearing Conservation. The prevention or minimization of noise-induced deafness through the use of hearing protection devices, the control of noise through engineering methods, annual audiometric tests, and employee training.

Hertz (Hz). Unit of measurement of frequency, numerically equal to cycles per second.

Impact/Impulse Noise. A sharp burst of sound occurring for less than one-half second in duration and not repeating more than once per second.

Intermittent Noise. Exposure to a given broadband sound-pressure level several times during a normal workday.

Noise. Any unwanted sound.

Noise Monitoring Program. A program where the noise levels to which employees are exposed are recorded using area and/or personal noise monitoring. The sampling strategy is

designed to identify employees for inclusion in a Hearing Conservation Program and to enable the proper selection of hearing protectors.

NOTE:	A Noise Monitoring Program is required when information indicates that any employee's exposure may equal or exceed an 8-hour time-weighted average of 85 decibels.

Operating Unit. For the purpose of this procedure, Operating Unit includes the National Centers for Environmental Prediction (NCEP), National Data Buoy Center (NDBC), NWS Training Center (NWSTC), National Reconditioning Center (NRC), Radar Operations Center (ROC), or the Sterling Research & Development Center (SR&DC).

OSHA. Occupational Safety and Health Administration.

Slow Response. A sound measurement in which all of the high-level noises of short-lived duration are averaged out.

Sound Level Meter. An instrument for the measurement of sound level.

Station Manager. For the purpose of this procedure, the Station Manager shall be either the NWS Regional Director; Directors of Centers under NCEP (Aviation Weather Center, NP6; Storm Prediction Center, NP7; and Tropical Prediction Center, NP8); Directors of the NDBC, NWSTC, and Chiefs of NRC, ROC and SR&DC facilities; or Meteorologist in Charge (MIC), Hydrologist in Charge (HIC), or Official in Charge (OIC).

Time Weighted Average Sound Level (TWA). That sound level, which if constant over an 8-hour exposure, would result in the same noise dose as is measured.

11.3 Procedure

11.3.1 General Requirements for Short Term High-Level Noise Exposure.

a. Suitable hearing protectors (ear plugs and/or ear muffs) are recommended for use whenever personnel are exposed to high levels of noise even if it is for short periods of time and below the 8-hour TWA of 85 dBA (e.g., inside the emergency generator facility when the generator is on-line; sandblasting cabinets at the NDBC; some facilities adjacent to airports, etc.).

b. Personnel who use hearing protection (e.g., inside the Emergency Generator building when the generator is on-line) and are not required to be in a Hearing Conservation Program shall receive annual training in the following areas: the effects of noise; the purpose, advantages, and disadvantages of various types of hearing protectors; and the selection, fit, and care of hearing protectors. Employees can either be trained in-house or off-site by qualified NWS or contractor personnel.

11.3.2 Requirements of a Hearing Conservation Program.

When employees are subjected to sound levels exceeding those listed in Table 11-1, It is the policy of the NWS to adhere to the provisions of 29 CFR 1910.95, "Occupational Noise Exposure," including the following:

a. Feasible administrative or engineering controls shall be utilized to provide protection against the effects of the noise exposure. Examples of noise control measures include making alterations in engineering design, damping and/or isolation of the noise and limiting the time of exposure.

TABLE 11-1 - PERMISSIBLE NOISE EXPOSURES

Duration Per Day (Hours)	Sound Level (dBA), Slow Response
8	90
6	92
4	95
3	97
2	100
1 ½	102
1	105
½	110
¼ or less	115

b. If engineering and/or administrative controls fail to reduce sound levels within the levels of Table 11-1 when measured on the A scale of a standard sound level meter at slow response, personal protective equipment (hearing protectors) shall be provided to reduce sound levels to levels equal to or less than those in the Table.

c. Hearing protectors shall be used by employees exposed to any continuous noise above 115 dBA, and any impulse or impact noise greater than 140 dB peak sound pressure level.

d. A continuing, effective Hearing Conservation Program shall be administered whenever employee noise exposures equal or exceed an 8-hour time-weighted average sound level of 85 decibels measured on the A scale (slow response) or, equivalently, a dose of 50 percent.

e. When any employee's exposure may equal or exceed an 8-hour TWA of 85 dBA, these requirements shall be followed:

(1) A Noise Monitoring Program shall be developed and implemented. The sampling strategy shall be designed to identify employees for inclusion in a Hearing Conservation Program and to enable the proper selection of hearing protectors.

(2) Noise monitoring shall be repeated whenever a change in production, process, equipment or controls increases noise exposures to the extent that additional employees may be exposed at or above the Action Level, or the attenuation provided by hearing protectors being used by employees is inadequate.

(3) Affected employees shall be notified of the results of the required noise monitoring.

NOTE: Affected employees and their representatives shall have the opportunity to observe any noise monitoring conducted.

(4) An audiometric testing program shall be established and maintained for affected employees. Within six months of an employee's first exposure at or above the Action Level, a valid baseline audiogram shall be established. At least annually after obtaining the baseline audiogram, a new audiogram shall be obtained for each employee exposed at or above an 8-hour time-weighted average of 85 decibels. The program shall be provided at no cost to the employees.

(5) Hearing protectors shall be made available to affected employees and replaced as necessary. Hearing protectors shall attenuate employee exposure, at a minimum, to an 8-hour TWA of 90 dBA.

(6) In affected areas, signs which read "Hearing Protection Required" shall be posted at each entrance.

(7) A training program dealing with hearing conservation shall be implemented for all employees who are exposed to noise at or above the Action Level.

f. An accurate record of all employee exposure measurements shall be maintained for employees subjected to sound levels exceeding those listed in Table 11-1.

(1) Noise exposure measurement records shall be retained for two years.

(2) Audiometric test records shall be retained for the duration of the affected employees employment. (See Attachment A, Sample Format for Audiometric Test Records.)

11.4 Quality Control

11.4.1 Regional or Operating Unit Environmental/Safety Coordinators

a. Shall perform an annual assessment of the regional headquarters facilities or operating unit to monitor and promote compliance with the requirements of this procedure.

b. Shall perform assessments or designate personnel to perform assessments of all field offices to monitor and promote compliance with the requirements of this procedure every two years.

11.4.2 Station Manager

Shall review, or delegate review, of this procedure on an annual basis to ensure that the facility is complying with its requirements. Confirmation of this review shall be forwarded to the Regional or Operating Unit Environmental/Safety Coordinator.

11.4.3 NWS Headquarters (NWSH)

a. The NWS Safety Office shall perform an annual assessment of the NWSH facilities to ensure that the facilities are in compliance with this procedure.

b. The NWSH Safety Office shall periodically perform an assessment of the regional headquarters and field offices to ensure compliance with this procedure. The frequency of these regional and field office assessments shall be determined by the NWSH Safety Office.

c. Requests for clarification concerning this procedure shall be directed to the NWSH Safety Office.

11.5 Responsibilities

11.5.1 Regional or Operating Unit Environmental/Safety Coordinators*

Shall monitor and coordinate to promote compliance with the requirements of this procedure for the regional headquarters, and field offices or operating units.

11.5.2 Station Manager*

a. Shall have oversight over the implementation of this procedure, and ensure that the requirements of this procedure are followed by individuals at the NWS facility.

b. Shall ensure that noise levels are measured and documented throughout the facility.

c. Shall ensure that suitable hearing protectors are provided to personnel as needed and are worn.

d. Shall ensure that initial and periodic inventory of hearing PPE, postings/signs and other safety equipment is accomplished and adequate stock is maintained.

11.5.3 Safety or Environmental/Safety Focal Point*

Shall ensure that any responsibilities delegated to them by the Station Manager are implemented in accordance with the requirements of this procedure.

11.5.4 Employees

a. Individual employees affected by this procedure are required to read, understand and comply with the requirements of this procedure.

b. Report unsafe or unhealthful conditions and practices to their supervisor or safety focal point.

NOTE:	* - Reference WSOM Chapter A-45 for complete list of responsibilities.

11.6 References

Incorporated References. The following list of references was incorporated as a whole or in part into this procedure. These references can provide addition, explanation or guidance for the implementation of this procedure.

11.6.1 American Conference of Governmental Industrial Hygienists, TLV's and BEI's, Threshold Limit Values for Chemical Substances and Physical Agents, Current Edition.

11.6.2 American National Standards Institute, ANSI S1.4-1983 (R1997), "Sound Level Meter".

11.6.3 American National Standards Institute, ANSI S1.25-1991, "Personal Noise Dosimeters".

11.6.4 Department of Commerce (DOC) Safety Manual, July 1997.

11.6.5 National Institute for Occupational safety and Health, NIOSH Criteria for a Recommended Standard: Occupational Exposure to Noise (1972).

11.6.6 U.S. Department of Labor, Occupational Safety and Health Administration, 29 CFR 1910.95, "Occupational Noise Exposures" (1998).

11.7 Attachments

Attachment A: Sample Format for Audiometric Test Records.

Attachment B: Noise Survey for the WFO, Springfield, MO

ATTACHMENT A

Sample Format for Audiometric Test Records

Audiometric Testing Date_____

Name:_____

Type of Testing: ” Annual ” Baseline ” Other

Tested by:_____

Previous Job with Loud Noise_____

Wears Hearing Protection_____

H.P. prior to test_____

Loud Noise in past 14 hours_____

Wears Hearing Aid_____

Family Member hearing loss <50 yr._____

Ear Pain_____

Ear Drainage_____

Vertigo/Imbalance_____

Tinnitus_____

Sudden Hearing Loss History_____

Intermittent Hearing Loss_____

Fullness/Discomfort in Ears_____

Cerumen Impaction_____

Foreign Body in Canal_____

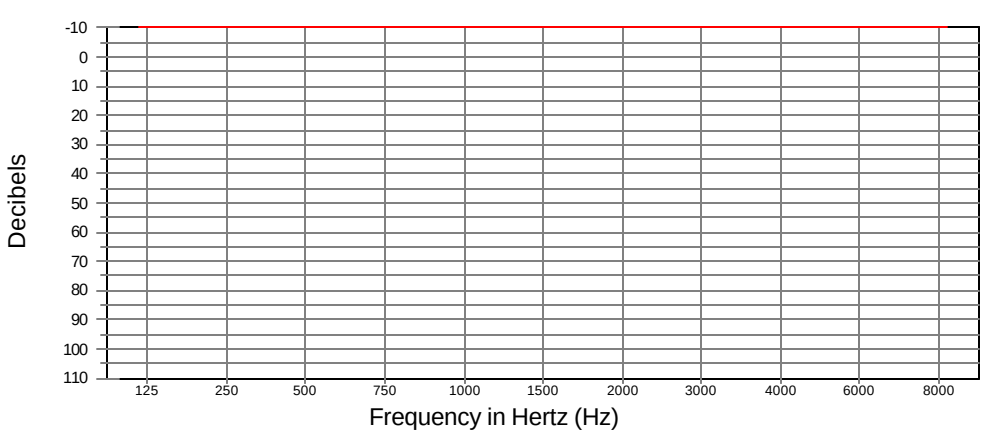
Unconscious-Head Injury_____

Allergies/Hay Fever_____

Measles_____

Mumps_____

Scarlet



Fever_____

_____

Head Cold Today_____

Military Service_____

Noisy Hobbies_____

Loud Music with Headphones_____

ATTACHMENT B

Noise Survey for the WFO, Springfield, MO

January 12, 2000

1.0 Introduction

On January 12, 2000, a noise survey was conducted for the National Weather Service (NWS) at the Springfield Weather Forecast Office (WFO) in Springfield, Missouri by EG&G Technical Services.

1.1 Background on the Springfield Weather Forecast Office

At the time of the survey, the Springfield WFO had a total of 22 employees which included the Meteorologist-in Charge (MIC), an Administrative Assistant, four Managers, ten Forecasters, five Meteorological Technicians and Interns, and one Electronics Technician (ET).

1.2 Purpose and Objectives

The purpose of this noise survey was to identify the potential for occupational hearing loss among Springfield's employees.

The objectives of this survey included: 1) complying with the requirements of NWS Procedure 13, "Hearing Conservation", 2) complying with the Occupational Safety and Health Administration's (OSHA's) " Occupational Noise Exposure" Standard, 29 CFR 1910.95, and 3) identifying those areas, workers, or job classifications where an 8-hour TWA of 85 dBA could be exceeded.

1.3 Scope

The survey consisted of two separate segments or operations: 1) personal noise monitoring using dosimeters, and 2) area noise monitoring using a sound level meter (SLM).

Personal monitoring was used as the primary method of estimating noise exposure at the Springfield WFO. Field personnel working around/with noise producing equipment (e.g., emergency generator) were seen as having the highest potential for noise exposure.

Area monitoring was performed using a Sound Level Meter (SLM) in order to get a snapshot of facility noise levels at a point in time. Area noise monitoring included twenty-three SLM readings taken at various locations throughout the facility.

The requirements specified in OSHA's "Occupational Noise Exposure" Standard (29 CFR 1910.95) were used as the basis for assessing exposures at the Springfield WFO.

2.0 Review of the Literature

OSHA requires that the employer administer a continuing, effective Hearing Conservation Program whenever employee noise exposures equal or exceed an 8-hour time-weighted average sound level (TWA) of 85 decibels measured on the A scale (slow response) or, equivalently, a dose of 50 percent. An 8-hour time-weighted average of 85 decibels or a dose of 50 percent is referred to by OSHA as the Action Level. Noise dosimeters are special sound level meters that integrate sound pressure levels over time and are used to measure personal noise exposures. A dosimeter measures a worker's exposure to noise -- continuous as well as sudden or "impact"

noise -- to help in the control of these exposures within standard or recommended levels. Accumulating dose is the basic job of a noise dosimeter. The dose is calculated based on the threshold value of 80 dB (per the OSHA Hearing Conservation Standard: 90 dB criterion level, 80 dB threshold, and 5 dB doubling rate). The doubling rate describes the number of additional decibels at which a worker's noise exposure is doubled for the same amount of time. A criterion level is the continuous A-weighted sound level which constitutes 100% of an allowable exposure. For example, using OSHA's 90 dB criterion level for an 8-hour day and the 5 dB doubling rate, workers are permitted to be exposed to a sound level of 95 dB for four hours. To calculate noise exposures in locations or job classifications where sound pressure levels vary, the total sound pressure exposure or dose must be determined. Dose is calculated based on the actual exposure time at a given sound pressure level divided by the allowable exposure time at that level. From Table A-1 in 29 CFR 1910.95, a 90 dBA TWA is equivalent to a dose of 100%. If an individual's total dose exceeds 100% or unity, that individual would be excessively exposed.

Measuring compliance with OSHA's noise standard requires knowledge of noise exposure over a specified range and knowledge of the exposure time at each noise level.

3.0 Methodology

The sampling strategy for the noise survey was designed to identify employees for inclusion in the hearing conservation program, to enable proper selection of hearing protection, and to provide baseline noise information for the Springfield facility.

3.1 Personal Noise Monitoring

Noise dosimeters were employed as part of this survey due to the mobility of the field personnel in conjunction with variations in the sound levels. Two Ametek Mark-3 dosimeters with Ametek AC-94 Acoustic Calibrators were used to conduct the personal noise monitoring portion of the survey. All continuous, intermittent and impulsive sound levels from 80 decibels to 130 decibels were integrated into the noise measurements. The dosimeters were calibrated before and after every use in order to ensure measurement accuracy.

On January 12, from approximately 8:30 a.m. until approximately 4:30 p.m., the dosimeters were worn by the following NWS personnel: Jon Christian and Steve Becka. WFO personnel typically work an 8-hour shift. However, the dosimeter Run Time (Exposure Time) varied based on the time each dosimeter was put on-line and subsequently taken off-line.

For the two employees wearing the dosimeters, the dosimeter microphones were mounted at the top of their shoulders and set to point upward as much as possible in order to help the dosimeter capture the same noise dose as the employees.

3.2 Area Noise Monitoring

The area noise monitoring portion of the noise survey was done with a sound level meter (SLM). A SLM is an instrument used to monitor air pressure changes resulting from environmental sound/noise.

A Quest 2700 Sound Level Meter (SLM) was used in conducting the monitoring. The Quest 2700 SLM is designed to meet or exceed ANSI Standard S1.4-1983 for type two instrumentation and IEC-651 type 2. The measurable sound level range of the 2700 SLM is 30 to 140 dB. This SLM is accurate to within 1.0 dB up to 146 dB SPL without notable distortion. The SLM was calibrated before and after use using a Quest 2700 QC-10 Calibrator with the meter set on LIN, SLOW, SPL, at a Range of 60-120 dB.

At each of twenty-three monitoring locations, a dBA reading was taken and recorded. The readings were taken at various locations throughout the facility as well as in the WFO. The sampling strategy was to attempt and identify all of the major noise sources with equipment running.

4.0 Results and Discussion

4.1 Summary of Results

Table 1.0 on the following page provides an overview of the data collected as part of the personal monitoring portion of the noise survey. The personal monitoring (dosimeter) data form is in the Appendix.

From Table 1.0, neither person received an 8-hour TWAs greater than 85 dBA. Per 29 CAR 1910.95, OSHA stipulates that workers can be exposed to 90 dBA for eight hours. Based on the results of the personal monitoring, Jon and Steve were not exposed to TWA noise levels greater than those allowed by OSHA. However, the maximum sound pressure level (Lmax) was 120.0 dBA.

TABLE 1.0, Dosimeter Monitoring Data

Date	Personnel/ Job Classification	Noise Dose (%)	Exposure Time (hours)	Lmax (dBA)	Sound Pressure Level (Leq/Lavg) for Sampling Period in dBA	Equivalent 8-hour Sound Level in dBA (TWA)
1/12/00	Jon Christian/ Sector Facility Technician (SFT)	11.2	8.05	120.0	74.1	74.1
1/12/00	Steve Becka/ Regional Environmental/ Safety Coordinator	3.0	8.08	109.0	64.7	64.7

NOTE: Lmax is the highest sound pressure level (dBA) encountered during the exposure time.

In the area monitoring portion of the sound survey, sound levels ranged from a low of 47 dBA in the WFO to a high of 109 dBA in the WFO Emergency Generator Building with the generator running. As expected, higher noise level were recorded where noise producing equipment was operating, e.g. 90 dBA by the Klystron with the doors open. The Appendix contains Figure 1.0, "Sound Pressure Levels (dBA) at Area Noise Monitoring Locations" as well as the data sheets for the area monitoring.

5.0 Recommendations

OSHA requires that the employer administer a continuing, effective hearing conservation program whenever employee noise exposures equal or exceed an 8-hour time-weighted average sound level (TWA) of 85 decibels measured on the A scale (slow response) or, equivalently, a dose of 50 percent. The results of the personal noise monitoring indicated that Jon Christian was potentially exposed to a TWA of 74.1 dBA (a noise dose of 11.2 percent) while Steve Becka was potentially exposed to a TWA of 64.7 dBA (a noise dose of 3.0 percent). Both employees' noise exposures were less than a TWA of 85 dBA, or equivalently, a dose of 50 percent, therefore, a formal Hearing Conservation Program is not required at the Springfield WFO at this time.

From Table 1.0, Jon Christian was potentially exposed to a maximum sound pressure level of 120 dBA. Per OSHA's "Industrial Hygiene Technical Manual", Volume VI, OSHA 1980, Chapter VI, Section F, "Sound levels in excess of 115 dBA are never permitted regardless of

the brevity of exposure unless hearing protection is worn and will attenuate (as worn by the employee) the noise exposure to within the permissible range of Tables G-16 and D-2." These tables are found in 29 CFR 1910.95, OSHA's "Occupational Noise Exposure" Standard. While engineering and administrative controls are the best long-term solution to noise problems, any employee with the potential of being exposed to sound levels greater than 115 dBA should wear hearing protection.

Personnel potentially exposed to noise should be provided hazard awareness training, as well as information on the effects of excessive exposure, areas where noise levels pose a hazard, and means available for reducing exposure risk, e.g., use of hearing protection.

"Hearing Protection Required" signs are required in areas or around equipment where the sound pressure levels (SPL) are greater than or equal to 85 dBA. Signs are needed in the following areas: 1) at the WFO heat pumps, 2) on the door to the WFO Emergency Generator Building, 3) on the door to the RDA Generator Building, and 4) on the door to the RDA Shelter. Hearing protection shall be provided when personnel are working in these areas. The hearing protection must be adequate to reduce noise exposures to acceptable levels.

Appendix 1: Field Monitoring Data Form

Integrated Monitoring for Sound Levels

Date: January 12, 2000 Monitoring Conducted By: David Frye

Facility Name and Location: Springfield Weather Forecast Office, Springfield, Missouri

Audio Dosimeters: Ametek Mark-3 Audio Dosimeter

Calibrator: Ametek AC-94 Acoustical Calibrator, Serial No. 5920

Air Temperature: 40 °F Relative Humidity: 92% Threshold Level: 80 dB Criterion Level: 90 dB Doubling Rate: 5 dB

Employee Name/ Job Description	Dosimeter Serial Number	Pre-Monitoring Calibration	Post-Monitoring Calibration	Sample Start-Time/ Finish-Time	Run Time (T) (Hours: Minutes)	Maximum Sound Pressure Level (Lmax) (dBA)	Dose (%)	Sound Pressure Level (Leq/Lavg) (dBA)
Jon Christian - Sector Facility Technician	11836	94.3 dB	94.3 dB	8:30 a.m./ 4:33 p.m.	8:03	120.0	11.2	74.1
Steve Becka - Regional E/S Coordinator	017740	94.0 dB	94.2 dB	8:35 a.m./ 4:40 p.m.	8:05	109.0	3.0	64.7

Field Notes: _____ (frm-001)

Appendix 2: Field Monitoring Data Form

Real-Time Monitoring For Sound Levels

Date: 1/12/2000 Monitoring Conducted By: David Frye/EG&G Technical Services

Facility Name and Location: Springfield Weather Forecast Office, Springfield, Missouri

Sound Level Meter (Manufacturer/Model/Serial #): Quest 2700 Sound Level Meter, Serial #HU5030018

Calibrator (Manufacturer/Model//Serial #): Quest 2700 QC-10 Calibrator, Serial #QE5030152

Pre-Monitor Calibration: 114.0 dB@ LIN, SLOW, 60-120 dB Range Post-Monitor Calibration: 114.0 dB@ LIN, SLOW, 60-120 dB Range Sound Level Meter Settings: "A" Weighting, SLOW Response, dB Range of 80-140

Location Number*	Identification of Area	dBA	Location Number*	Identification of Area	dBA	Location Number*	Identification of Area	dBA
1	WFO Reception Area	47	**8**	North Parking Lot	53	****15**	WFO Em.Gen. Bld.	109
2	WFO Operations Area	53	**9**	WFO West Exterior	55	****16**	WFO Em.Gen. Bld. Exterior	95
3	WFO Equipment Room	70	**10**	South Fence Line	60	****17**	RDA Generator Bld.	104
4	WFO Communications Room	62	**11**	WFO Heat Pump	84	****18**	RDA Gen. Exhaust	93
5	WFO Electrical Room	71	**12**	WFO Heat Pump	87	****19**	RDA Shelter A/C Exhaust	82
6	WFO Electrical Room - Wet Dry Vac operating	95	**13**	WFO Heat Pump	89	**20**	Klystron off-line	72
7	Outside Upper Air Bld.	57	**14**	WFO East Exterior	53	**21**	Kly on-line doors closed	76

Field Notes: * See the attached facility drawing (Figure 1.0). ** Generator on-line. (frm-002)

Field Monitoring Data Form

Real-Time Monitoring For Sound Levels

Date: 1/12/2000 Monitoring Conducted By: David Frye/EG&G Technical Services

Facility Name and Location: Springfield Weather Forecast Office, Springfield, Missouri

Sound Level Meter (Manufacturer/Model/Serial #): Quest 2700 Sound Level Meter, Serial #HU5030018

Calibrator (Manufacturer/Model//Serial #): Quest 2700 QC-10 Calibrator, Serial #QE5030152

Pre-Monitor Calibration: 114.0 dB@ LIN, SLOW, 60-120 dB Range Post-Monitor Calibration: 114.0 dB@ LIN, SLOW, 60-120 dB Range Sound Level Meter Settings: "A" Weighting, SLOW Response, dB Range of 80-140

Location Number*	Identification of Area	dBA	Location Number*	Identification of Area	dBA	Location Number*	Identification of Area	dBA
22	Kly on-line doors open	90	**29**			**36**		
23	RDA A/C Exhaust	82	**30**			**37**		
24			**31**			**38**		
25			**32**			**39**		
26			**33**			**40**		
27			**34**			**41**		
28			**35**			**42**		

Field Notes: * See the attached facility drawing (Figure 1.0).

(frm-002)